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SUSTAINABILITY CURRICULA IN DESIGN EDUCATION

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ABSTRACT
While sustainability in Design finds much attention in the literature, the education of sustainability in Design courses lacks discussion regarding curricula and importance. In an attempt to map the way sustainability is taught in Design Bachelor and Master Courses in the European Union, we began analysing faculties from a number of EU countries and present the initial results in the form of graphics, and, in addition to that, we discuss curricular contents. Furthermore, we looked at the United Nations Decade of Education for Sustainable Development 2005-2014 – an initiative that comprehends the UNECE region (that includes several EU member states), which has contributed to publications related to Design and sustainability, in order to understand how it has been (and can be) supporting the education of sustainability in Design. The purpose of this paper is to discuss the current practice in sustainability education in Design in the EU context and introduce the development of a sustainability curriculum for Design courses.

Keywords: Design education, sustainability, affective sustainability

1 INTRODUCTION

Besides scientific evidence, there is social and cultural confirmation of a change in life, production and consumption paradigms [1]. We are shifting from a scenario with no limit to the extraction and use of natural resources, and with a consequent increase of access to consumer goods – to find ourselves in moment of transition, starting with a change in the notion of wellbeing that implies less or alternative consumption.
Sustainability in Design derives from the need to make products, services and other solutions that allow for the conservation of the natural and built environment in an equitable manner [2]. The importance of presenting a complete view on sustainability to Design students, and on the topics and projects developed in the educational setting of the university, rests on the need to instruct conscientious designers that are aware of the necessity to involve both the natural and the human element into the equation – society, culture and the human force behind the development, manufacture and use of products, services and spaces.
The concept of sustainability is quite wide, and can be analysed both from a material and a human (social, cultural, affective) perspective [3]. The most common definitions of sustainable design refer to the materiality of products and the efficient use of resources so as not to compromise the ability of future generations to provide for their own needs [4], [5], [1], [2]. However, this concept is also linked with social and cultural issues and with a holistic view that includes processes and context, natural and human [6], [7]. A sustainable business, for example, is sustainable not only if it thrives financially or if it is innocuous to the environment, but also if it allows for the human force behind it to "want" to make it prosper. The definition of sustainability as a tripolar model (triple bottom line), with the pillars of people, planet and profit (social/cultural sustainability, environmental sustainability and economic sustainability) as the basis of the concept, is beginning to be contested by some authors [8] as being too simplistic. Take for instance the World Business Council for Sustainable Development "*Vision 2050"* [9] - it offers a more complex and comprehensive structure for the elements that compose sustainability, referring to nine different topics: people's values (behaviours), human development, economy, agriculture, forests, energy & power, buildings, mobility and materials (innovation). There are also various scales to take into consideration when defining the concept of 'sustainability': on the one hand, sustainability can be perceived as a concept advocated by environmental experts selling

solutions to high profile contexts, but it can also be, on the other hand, understood as a concept championed by small groups and indigenous populations seeking to preserve traditional techniques and practices and to encourage the change at community scale [7]. According to Chapman [10] sustainable design has developed an approach that tends to limit itself to suppressing symptoms of an ecological crisis, rather than tackle the real causes, meaning that it fails the deep understanding of human consumption and disposal of products. In other words, sustainable design has resigned to a peripheral role in solving the problems instead of reaching its potential as a pioneer in social change.
Focussing on sustainability in Product Design particularly, several authors [3], [10], [11], [12] add that the sustainability of an artefact has to be considered in terms of affection, in addition to its materiality, since it is this human element that ultimately distinguishes the project as timeless and truly sustainable. Borjesson [3] proposes that designers take into consideration the assessment of emotion and pleasure as a parameter, adding – with reference to the work of Damásio [13] – that emotions are vital in decision-making (when choosing an object for purchase, for example); and that the terms 'emotion', 'affection' and even 'spiritual' are used to describe, several times, the quality of an object. In this sense, we can affirm that sustainability does not only relate to natural process and context, but also to the affectivity bonds that often allow humans to keep objects that, for example, no longer serve practical functions (but are still valued for their history, appearance or other characteristics) – in sum sustainability (in Design) has to do with affectivity in addition to resilience.
The idea of enriching objects with symbolic features with the intention of expanding their lifecycle increases their sustainability and ultimately can become leverage for companies that might have reached a technology ceiling, which simply means that it is increasingly difficult to get ahead of the competition in terms of, for example, functionality, technical reliability or manufacturing costs. As such, this approach becomes a new impulse for the industry, for retailers and for consumers as well, with the manufacturing, selling and using of products that potentially get more attention and a prolonged duration compared to other objects. This allows us to conclude that there is no longer a question that sustainability is fundamental in Design practice, and therefore, in Design education.

2 THE UNESCO DECADE OF EDUCATION FOR SUSTAINABLE DEVELOPMENT

In 2005 the High-level meeting of Environmental and Education Ministries adopted the UNECE Strategy for Education for Sustainable Development. The Strategy was developed with governments, educational institutions, NGO and other stakeholders of the UNECE region – which is comprised of 56 member states [14]. This Strategy is a policy tool to promote Education for Sustainable Development (ESD) at national and local levels in the UNECE region, with costs borne by each country. As part of the UNECE Strategy for ESD, The United Nations Decade of Education for Sustainable Development 2005-2014 has a vision of using education as a catalyst to stimulate changes in values, attitudes and lifestyles to ensure a sustainable future and the evolution of just societies. The DESD has contributed to publications related to Design and Sustainability. Furthermore, it has developed a framework for Education for Sustainability (EfS) that can be used as a foundation for a sustainability curriculum for Design education.

2.1 Education for Sustainability (EfS) framework

The EfS framework developed in the context of the Decade of Education for Sustainable Development aims to provide a foundation for the implementation of changes to the Education for Sustainable Development practice. The actions that such framework is able to bring to education practice are the integration of inter and multi-disciplinary elements in single curricular unit programmes; the encouragement of experimental teaching and learning, so that the applications of area of study can be further explored; the addition of thematic interests that were little or not at all explored previously (e.g. in Design education: community, globalization and society, globalization and trade, Corporate Social Responsibility, accountability and ethics, health and wellbeing, cultural preservation, etc.); the innovation of curricular contents instead of mere addition; the encouragement of questioning beyond knowledge transfer and issue awareness; the provision of a view of people as changing agents, rather that the problem; the encouragement of reflection and discussion of creative solutions in new frames of mind; the introduction of collaborative ways of thinking and doing.
According to UNESCO, the use of the EfS framework is aimed at creating an understanding and an application of the concept of sustainability, by appealing to the use of additional and different

processes in education, of new approaches, and of the involvement of people rather than the mere conveyance of a body of knowledge. It identifies connections and relationships, and shifts the thought from 'things' to 'processes', also integrating decision-making and adaptive management techniques. The UNESCO EfS framework consists of three main cores: Society (social institutions and their role in change and development; the democratic and participatory systems which give opportunity for the expression of opinion; etc. [15]); Environment (resources and fragility of the physical environment; the effects on it of human activity and decisions; etc. [15]); and Economy (sensitivity to the limits and potential of economic growth; their impact on society and on the environment; the commitment to assess levels of consumption; the concern for the environment and for social justice [15]). In a closer perspective on the framework, we find sustainability issues that are transversal to these mentioned cores, giving it more complete and holistic characteristics. Such issues include overcoming poverty; gender roles and equality; health promotion; rural transformation; sustainable consumption; indigenous knowledge; sustainable urbanization; and corporate responsibility, among others. This framework is intended to be interdisciplinary and holistic; value-driven; based on critical thinking and problem solving; multi-method; based on participatory decision-making; applicable in a day to day personal and professional life; and locally relevant [15].

3 SUSTAINABILITY IN DESIGN EDUCATION IN E.U. COUNTRIES

The choice of European Union faculties to conduct an analysis about the existence and contents of sustainability curricula in Design education has to do with the common ground that the member states share regarding education policies and culture: despite the fact that the EU member states have not shown hitherto the will to delegate sovereignty in matters of Education, it is possible to observe a progressive tendency towards convergence – not in the sense of standardization of curricula, but of resulting degrees (notice the ECTS system, the mobility programmes, the Bologna[1] process, etc.). In this sense, and because EU member states are included in an intergovernmental and supranational governing system, and share common legislation in many policy areas, the EU becomes an ideal case study. In this investigation, the collected information was planned to have two stages: a first approach to the online information that the high education entities offer potential students in their websites, and a second stage of contact with the institutions in order to acquire more information and detailed curricula. At this point of our investigation we have (partially) observed one third of the EU countries and 36 high education institutions that offer Bachelor or Master courses in industrial design (or similar), in a first stage approach.

3.1 First results

Table 1 shows the results of (partially) analysed countries and respective faculties in regards to the existence of a sustainability component in Design courses.

Table 1. Collected data from 36 EU high education establishments (abbreviations: C.U. – curricular unit; B – Bachelor course; M – Master course; (e) – elective)

Country	University/Faculty	Course	Sustainability C.U.	Sustainability C.U. (contents)	Potentially complementary C.U.
Austria	Angewandte Vienna	B, M	No	-	-
	Kunstuniversität Linz	B, M	No	-	-
Belgium	Media Arts Design Faculty (MAD)	B, M	in M course	"Art/Object & Design": sustainability, users	-
	Artesis	B, M	in B course	"Eco-design"	-
	ARBA-ESA	M	no	-	-
Country	University/Faculty	Course	Sustainability C.U.	Sustainability C.U.	Potentially complementary

[1] The European Higher Education Area proposed by the Bologna Accords was not developed exclusively by EU institutions, but it includes several EU member states.

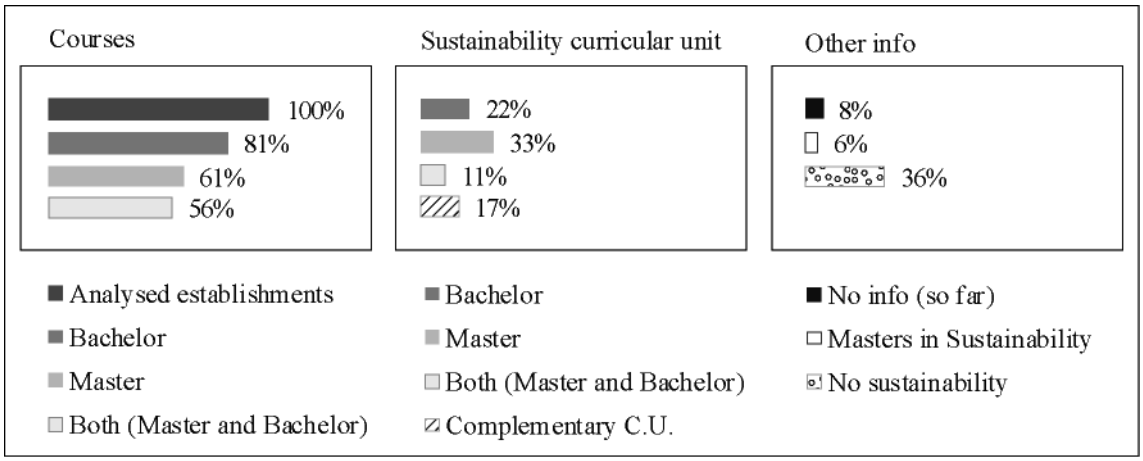
				(contents)	C.U.
Bulgaria	National Academy of Arts	B, M	yes	no info	no info
Czech Republic	UJEP	B, M	no	-	-
	UWB – IAD	B	no info	no info	no info
Estonia	EAA	B, M	in M course	"Project VI": sustainable solution in Design	"Material culture"; "Environment and Economical Structure"
Finland	Aalto University	B, M	in M course	Master in Creative Sustainability, "Systems Thinking for Sust. Communities" (e)	-
	LAMK Institute of Design	B	no info	no info	no info
France	ENSA Dijon	B	no	-	-
	IRAVM	B	no	-	-
Portugal	FAUTL	B, M	in M course	"Sustainable Design"	-
	IADE	B, M	yes	"Design for Sustainability" (in M course): material culture, ecology, systemic solutions	"Economy and Society" (in B course): fundaments of economy, scarce resources, innovation
	FBAUL	B, M	in B course	"Eco-design and Sustainability"	"Material Culture"
	ESAD Leiria	B, M	no	-	-
	ESAD Matosinhos	B, M	no	-	-
	Escola Superior Gallaecia	B	in B course	"Eco-design"	-
	Lusíada University	B, M	in M course	"Sustainability"	-
	Lusófona University	B, M	in M course	"Eco-design"	-
	EUAC Coimbra	B	in B course	"Design and Environment"	"Art and Culture"
	ESTG-IPVC	B	no	-	-
	University of Madeira	B	no	-	-
	University of Aveiro	B, M	in M course	"Sustainable Development" (e)	"Symbolic Valorisation of Artefacts" (e)
	FEUP	B, M	no	-	-
Country	University/Faculty	Course	Sustainability C.U.	Sustainability C.U. (contents)	Potentially complementary C.U.
Country	University/Faculty	Course	Sustainability C.U.	Sustainability C.U.	Potentially complementary

				(contents)	C.U.
UK	Central Saint Martins	B, M	no	-	-
	Coventry University	B, M	no	-	-
	Ravensbourne	B	yes	sustainability	contextual studies
	Royal College of Arts	M	yes	"Platform 13": global society, ecology issues, social/behaviour impact	-
	University of Brighton - Faculty of Arts	B, M	M course	Master in Sustainable Design	-
Country	University/Faculty	Course	Sustainability C.U.	Sustainability C.U. (contents)	Potentially complementary C.U.

C.U. – curricular unit | B – Bachelor course | M – Master course | (e) – elective

At this stage, following the on-going analysis of the education of sustainability in Design courses in EU faculties, we found that a number of the offered courses do not include a sustainability element (36% of the analysed establishments), and when present, it is frequently destined for Master Courses (33 % versus 22% in Bachelor courses). Some courses (17%) offer potentially complementary curricular units, even if separated from the sustainability component, they help understand it better. As mentioned, at this point of our investigation we have partially observed one third of the EU countries (which means that not all high education institutions offering Design education in each country has been analysed yet) and 36 high education institutions, which means that more work needs to be done in order to have more accurate and correct knowledge about the education of sustainability in Design in the European Union context. Figure 1 displays the results so far.

Figure 1. Results of investigation (so far), in percentages



4 DISCUSSION AND CONCLUSIONS

At this stage of the analysis of the Design Bachelor courses it is possible to state that the subject of sustainability is presented as being a "closed" component, confined to the teaching of the environmental impact of Design, but not reaching social, cultural or affective issues. Despite that, we found some courses on material culture (offered in addition to Eco-design or Sustainable Design courses), which can help understand sustainability as a complete concept – although they are presented as separate components. Several Master courses include the subject of sustainability in their curricula, even offering interesting perspectives (notice the Master Course 'Creative Sustainability' offered by the School of Art and Design of the Aalto University, which presents an elective workshop called 'Systems Thinking for Sustainable Communities' that aims at understanding the meaning of systems

thinking in the creation of sustainable urban communities). Nevertheless, in general, Design education often does not contemplate a complete approach on the issue of sustainability, confining it to ecological matters and failing in expanding it to a broad concept that also includes human context. The deficiencies in the inclusion of this component result in a consequent detriment of the quality of the graduate students' instruction. Considering that the percentage of Masters in Design is inferior to that of Bachelors in Design, we find it fundamental to introduce this topic to the Bachelor in Design curricula, so that a majority of trained designers can have a more complete perception on the topic of sustainability.

The objective of the analysis of sustainability curricula in Design and Sustainability courses in EU countries and of the discussions about the definitions of sustainability in Design Education (in literature) is to allow for the development of guidelines for a sustainability curriculum that includes contents that are lacking in current practice. The EfS (Education for Sustainability) framework developed in the context of the Decade of education for sustainable development [16] is an outline that can contribute to the development of a complete sustainability curriculum for Design education. In the progress of the current investigation, it is our goal to use the EfS framework as a contribution for the proposed curriculum.

As stated, the investigations is in progress, which means that a significant amount of information is yet to be disclosed regarding the practices of sustainability education in Design courses in the remaining EU countries, however the information presented in this paper is revealing of some tendencies.

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